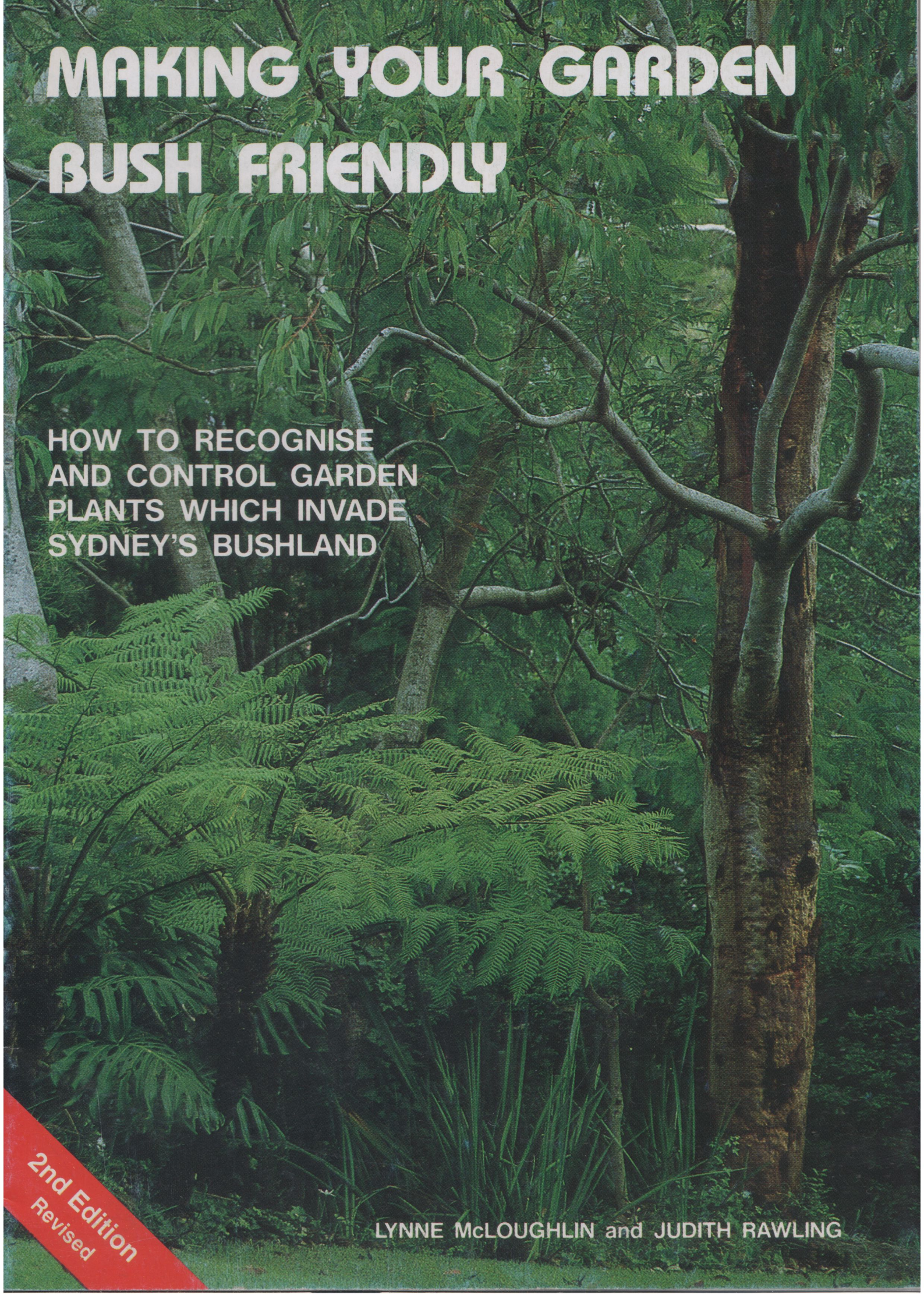
MAKING YOUR GARDEN BUSH FRIENDLY
HOW TO RECOGNISE AND CONTROL GARDEN PLANTS WHICH INVADE SYDNEY'S BUSHLAND
2nd Edition Revised
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THE WEED PROBLEM

There is a small number of exotic plants growing in Sydney's suburban gardens which threaten the very survival of our native bushland. Imported from other countries for ornamental, agricultural or soil conservation purposes, these plants threaten to replace our cherished Australian plants, degrade the values of our surburban bushland, and in some cases to restrict access.

Most of our "urban bushland weeds" are soft-leaved plants which thrive in the damp nutrient-enriched bush soils altered by runoff from stormwater drains. Free from their natural predators, the exotics have the edge on our own plants. Add to this the prolific seeding habits of most of these exotics and you have a no-win situation for the native species.

Weed seed reaches the bush in a variety of ways: by wind (e.g. crofton weed, pampas grass), via birds and other animals which eat the fruit and later drop the seed (e.g. privet, camphor laurel, lantana) or by rainwater washing seed from the stormwater drains into natural creek systems.

Seeds are continually dropped by birds into our gardens. Little privets, camphors and ochnas are often found in gardens along fences and under trees where the birds have perched. To save trouble later on check regularly for seedlings and pull them out as soon as you spot them!

Climbers, creepers and scramblers (e.g. wandering jew, honeysuckle, morning glory) and grasses (e.g. kikuyu, couch) propagate from the severed portions of the parent plant. These plants are able to invade bushland because many householders dispose of garden prunings and lawn clippings into the nearest piece of bush. Often these people are well-meaning and do not realize that their actions cause untold damage to the native plants.

Succulent plants (e.g. rubber plant, Queensland umbrella tree, mother of millions, sedums, cacti) are particularly troublesome when fragmented and dumped. As the name implies, most parts of the plant are swollen with stored food material. This allows broken segments to re-establish, even from tiny fragments. Most succulents grow easily, even in dry bushland soils, and soon form the nucleus of a new weed infestation.

Remember - any plant which grows and spreads quickly in your garden will do the same thing in the bush. Garden refuse does not improve the soil, nor does it "fertilise" the native plants - but it will eventually kill them! Always dispose of unwanted garden material responsibly. Never dump garden refuse in the bush.

Weeds also become established in the bush by seeds, bulbs or parts of plants washing down creeks or drains. Never leave piles of clippings or other garden debris stored near the edge of a watercourse or drain where a sudden storm surge may wash the material downstream into bushland. Compost heaps should be safely contained in a bin so that no material escapes.

MAKE YOUR GARDEN BUSH FRIENDLY!!
ELIMINATE THE SEED SOURCE FROM YOUR GARDEN
DON'T PLANT POTENTIALLY INVASIVE EXOTICS
NEVER DUMP GARDEN REFUSE INTO THE BUSHLAND

THE PRIVETS

BROAD-LEAVED PRIVET (*Ligustrum lucidum*)
SMALL-LEAVED or CHINESE PRIVET (*L. sinense*)

Originally from Asia, privet was once widely used as a hedgerow plant in formal parks and gardens. Unfortunately privet now poses a threat to the survival of many native plant communities. It fruits prolifically and the succulent berries are widely dispersed by birds. Seeds germinate easily and young plants grow aggressively, displacing virtually all native understorey species.

Privet is distributed throughout Sydney's bushland particularly in moist gullies and watercourses. The pollen of both species may contribute to asthma and hay fever attacks in spring and early summer.

BROAD-LEAVED PRIVET is a small tree but can attain a great size under favourable conditions. The dark green leaves, up to 12cm long, have wavy edges and are opposite in arrangement on the stem. In early summer heavily perfumed sprays of small white flowers form on the ends of the branches. The fruit ripens in late autumn and winter as grape-like clusters of small purple-black berries. The smooth bark has many raised corky pores which give the stem a bumpy appearance.

Be careful not to confuse broad-leaved privet with native look-alikes, sweet pittosporum *(Pittosporum undulatum),* and lillypilly, *(Acmena smithii).* Pittosporum berries are orange and its leaves are alternate with wavy edges and are almost always infested with small oval "scabs" caused by a leaf insect. The large, fleshy fruits of lillypilly are white to pink while the leaves are strongly aromatic with many tiny oil glands which are clearly visible when held up to the light.

CHINESE PRIVET is a small, shrubby plant which forms dense multi-stemmed stands up to 3m in height. The leaves, yellow-green to green, grow to 7cm with wavy edges. The flowers are similar to broad-leaved privet but Chinese privet flowers in spring. Clusters of dark purple berries ripen in winter, acting as a food source for birds.

Broad-leaved Privet with berries

Chinese Privet in flower

ERADICATION

Privet will always re-shoot from cut stems or from roots left in the soil. Lopping or felling privet without treating the stumps with herbicide is ineffective, as are ringbarking and burning.

Privet may be dug out, using a mattock or crowbar. However, you must remove ALL of the root system. Broad-leaved privet with a stem diameter of less than 3cm is quite easy to pull up but a similar sized Chinese privet has a more tenacious root which tends to break off when pulled.

If you opt for chemical control privet responds well to the use of the herbicide glyphosate - marketed as 'Roundup' (see centre page). Help control the spread of privet by removing all mature plants from your garden and be sure to check for new seedlings each spring.

CAMPHOR LAUREL

(Cinnamomum camphora)

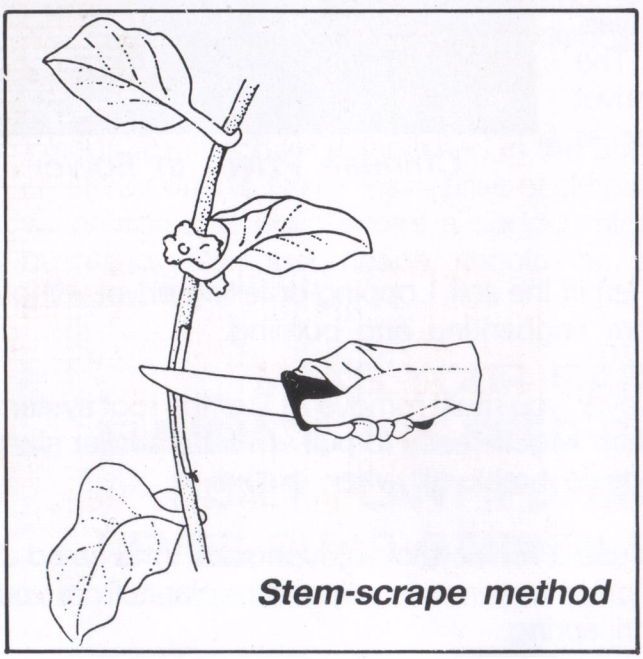
A native of China and Japan, camphor laurel grows to a ripe old age, forming a large spreading tree. Extensively planted in parks, gardens and as street trees in older suburbs it has invaded large areas of Sydney bushland. In common with most of our other serious weeds, its seeds are widely spread by birds.

Camphor laurel appears to produce a chemical inhibitor which prevents the growth of other plants, even its own seedlings, under its canopy line. The heavy shade it casts and its extensive root system enables the camphor to dominate all other vegetation once it becomes established.

The rough-barked, dark-grey trunk shows prominent vertical cracks although smaller branches are smooth and olive-green. Twigs are often red. The leaves are oval-shaped, glossy bright-green on the upper surface and dull-green below with prominent veins. Crushed leaves have a distinctive camphor odour, as does the cut timber. The insignificant white flowers bloom in October. The fruit is a small black berry which ripens from autumn to early winter.

ERADICATION As a large tree camphor laurel is difficult to remove, especially as it is likely to re-shoot after poisoning, cutting or burning. The only completely effective physical method is total removal of the root system. Herbicide treatment (see centre page) is effective provided enough herbicide is translocated into the large root system. Stem injection, cut-stumping or cutting into the swollen hole below ground surface and poisoning (where the stem and roots join) is recommended. Camphors frequently resprout after treatment as a ring of suckers around the trunk. If this happens cut and treat each sucker with herbicide.

Camphor laurel leaves, note the red stems



Stem-scrape method

BLACKBERRY

(Rubus fruticosus (agg.) spp.)

Originally from Europe the blackberry is now cosmopolitian in distribution. It is a common weed on disturbed land throughout Australia and has been declared a noxious plant in NSW. There are a number of native Rubus species in the Sydney area but these are not troublesome.

Blackberries are woody shrubs, up to 5m high with scrambling prickly stems to 6m. Stems often root at the tips to form interconnected thickets. The rough leaves are divided into 3-5 serrated leaflets. The flowers are pink to white, forming in clusters. The succulent berries ripen in late summer.

WANDERING JEW

(Tradescantia albiflora)

Wandering Jew is a garden escape which has become widely established in bushland through dumping of garden refuse. It grows quickly and spreads over the ground, forming a dense mat and smothering other small plants. This succulent herb grows best in damp places and tolerates moderate sun or shade. Once established it suppresses all other ground plants.

The weed has long brittle trailing stems with prominent leaf nodes which give rise to new plants if a piece is broken from the parent plant. Leaves are shiny, mid to dark-green with a few fine hairs at the base. The white flowers form a cluster at the end of the stem.

Wandering Jew is often confused with the native *Commelina cyanea* but the flowers of Commelina are bright blue and the roots are thick and fleshy while those of the weed species are very fine.

ERADICATION Herbicide is not usually effective although some people report success by spraying in early spring with 1:50 glyphosate followed by a second treatment 4-5 weeks later.

The plant is easy to handpull or rake but it is difficult to completely eliminate it on the first attempt. As the stems tend to shatter, all fragments must be removed to prevent re-shooting; and repeated weeding will be necessary. On hard surfaces it may be rolled up like a carpet and bagged for disposal. The root system is very shallow and only a few centimetres of soil need be removed. With Wandering Jew follow-up weeding is always the key to success.

Wandering Jew in flower

Blackberry in flower

ERADICATION

Blackberries can be mown or slashed but they will always regrow. Large roots must be dug out or poisoned. Single canes may be cut at ground level and treated with undiluted glyphosate. Thickets with a substantially larger leaf area respond well to spraying. A variety of herbicides are marketed for use on blackberry. Brush-off, Garlon and Roundup are all effective if used according to the directions on the label. For best results spray in late summer, between flowering and fruiting and be prepared to treat severe infestations for several years before you achieve complete control.

VINES - CLIMBERS AND SCRAMBLERS

The rampant growth of exotic vines threatens the survival of many areas of bushland. The presence of vines is almost always the result of dumping by thoughtless gardeners, although some species have succulent berries which are spread by birds. Once established, vines climb upwards, reaching for the light and forming smothering canopies over the tallest trees. They hang down in thick curtains as well as scrambling over the ground. Most of the weedy vines readily develop new roots and shoots from numerous growing points along the stems when they contact bare soil.

Exotic vines systematically kill native plants by overgrowing them, cutting the sunlight off from the canopy leaves and preventing the plant manufacturing its own food. Evergreen vines maintain a warm, moist blanket around the tree, encouraging fungal diseases of the bark and roots and eventually weakening it so that it becomes vulnerable to borers and other predators. At least nine exotic vines are serious weeds in the Sydney area.

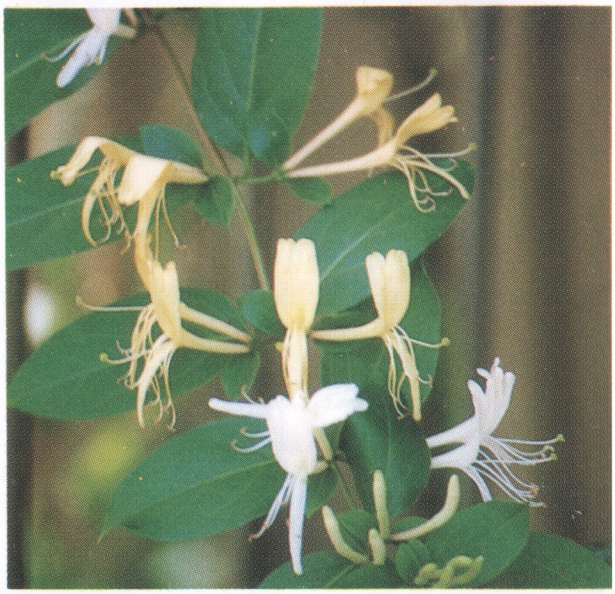
BALLOON VINE *(Cardiospermum grandiflorum)* is common in wet sites and along creeklines. It has a three-part serrated leaf like a grapevine leaf. Its many pale green, balloon-like fruit each holds three sizable black seeds. The balloon's skin becomes papery and light brown as it is ready to open. Balloon vine regenerates from root fragments but not from stem pieces.

MADEIRA VINE or **LAMB'S TAILS** *(Anredera cordifolia)* is a native of tropical South America which has become a serious weed of rainforests and moist forests throughout NSW. Its rope-like twining stem can become greatly thickened, and the heart-shaped fleshy leaves can reach 13cm in length. The small creamy flowers are held in long dropping sprays like "lambs tails". Reproduction is via large underground tubers and from aerial tubers which form football-sized clusters high on the climbing stems. When the stem is cut these tubers fall to the ground and may remain viable in the soil for many years before germinating to form new plants.

HONEYSUCKLE *(Lonicera japonica)* and **JASMINE** *(Jasminum polyanthum)* are popular ornamentals grown for their sweet-smelling spring flowers. Both species root at the leaf joints or nodes and both are scramblers which entwine with other plants, thus making them difficult to remove. Honeysuckle has thin stalky stems which become woody and thickened with age. The leaves are viable in shape but are usually lobed or toothed and the strongly scented flowers are yellow/white with a pink-tinged tube. Jasmine has a thin green twining stem and the clusters of white flowers have a strong scent. Spring-flowering jasmine is often implicated in hay fever attacks.

Balloon Vine with its distinctive balloon seed capsules

Madeira Vine with lamb's tails flowers and aerial tubers



Honeysuckle

MORNING GLORY: the common blue-flowered form has large heart-shaped leaves *(Ipomoea indica)* while the pink or mauve rariety *(I. cairica)* has a deeply dissected leaf. The pink form is sometimes called mile-a-minute plant. Both forms have large funnel-shaped flowers and small dark berry fruit. Both are vigorous climbers with hairy stems and large soft green leaves.

ARROWHEAD VINE or **POTATO VINE** *(Rumex sagittaus)* is a scrambler once used as a trellis and outhouse plant. It is difficult to eradicate because of the large underground tubers which form as a series of "potatoes" linked by thin strands of tissue. The flowers are less conspicuous than the small clusters of three-winged papery fruit. At first light green with a pink tinge, they turn pale brown when mature. Each winged envelope contains one seed which is wind-dispersed.

Other vines which invade local bushland are the yellow trumpet-flower or **CAT'S CLAW CREEPER** *(Macfadyena unguis-cati),* the **CALICO VINE** or **MOTH PLANT** *(Araujia hortorum)* and **CAPE IVY** *(Delairea odorata).* The moth vine is distinguished by its choko-like green fruit which splits open to shed masses of white cotton-like seeds.

Morning Glory

Arrowhead Vine with its small, three-winged papery fruit

ERADICATION

The successful treatment of exotic vines depends on the growth habit of the individual plant. Vines such as honeysuckle, jasmine and morning glory which root at the nodes may be removed by pulling firmly at each stem until a node is reached, then cutting each cluster of small roots with a sharp knife. Once you reach the main root system dig it out. Parts of the vine which are thoroughly tangled in other plants should be cut and left in place.

Vines may be treated with a foliar spray but this may not be possible if the vines are tangled with, or close to, desirable plants. A variation of the cut-stump, technique is effective. Gather a handful of stems and cut them through, dipping the root-side ends into undiluted glyphosate for 3-4 seconds. Let the treated stems drop to the ground.

Moth Vine

For control of plants with underground tubers such as rumex and madeira vine, spraying is less successful as too little herbicide enters the plant to penetrate through to all the tubers. Repeated applications may be necessary. Small regenerating plants from fragmented or fallen tubers respond well to spot-spraying.

To eradicate madeira vine use the **STEM-SCRAPE** technique. This is similar to the cut-stump method but DO NOT cut the stems. Scrape 3-4cm of the stem with the back of a knife and paint glyphosate onto the wound. This enables the herbicide to travel into the aerial tubers as well as underground. If you cut the stems the aerial tubers will fall to the ground unaffected.

OCHNA - THE MICKEY MOUSE BUSH or BIRD'S EYE BUSH

(Ochna serrulata)

A native of South Africa, ochna is a common garden escape in the Sydney area. Still a popular ornamental plant, it has become widespread in bushland as the copious supply of seeds in surburban gardens is readily available to foraging birds.

An angular shrub up to 2m high ochna has light brown, slightly rough stems and small curvy leaves with finely serrated edges. The new leaf growth is characteristically bronze, and appears in spring at the same time as the bright yellow flowers. The petals fall and the fruit forms the familiar "mickey mouse face" when the upper sepals turn bright red and the berries below ripen to black.

ERADICATION Ochna is difficult to eradicate. It has a tenacious tap root system and even young seedlings resist hand-pulling. Small pieces of the root will resprout so you must dig out the whole root system. Remove new seedlings as they appear before they get too firmly entrenched.

If using herbicide choose the cut-stump method (see centre page) and as well as cutting the stem make sure that you scour the bark down each side with a sharp knife. Apply herbicide to all exposed surfaces. Ochna requires the application of undiluted glyphosate, even for young seedlings.

Ochna

INDIA RUBBER TREE

(Ficus elastica)

The India Rubber Tree is a popular house plant which often grows too large for its pot - and the house! These unwanted pot plants often end up dumped into nearby bushland where they quickly take root to establish new plants. Even prunings from larger plants are capable of regeneration so care must be taken when disposing of any unwanted material.

The stems and leaves are thick and succulent and exude a milky sap when cut. The leaves are large and elongated with a conspicuous mid-vein. They often have a mauve or pink tint along the veins.

ERADICATION The tree has a very deep tap root which makes digging one out a major job. But if you tackle the task take great care to trace out all the lateral roots as well as the main root. The trunk can be injected with a herbicide such as glyphosate or cut-stumped, but the milky latex that runs out of the cut may dilute the herbicide. Several further treatments may necessary to kill the tree.

Rubber Tree with its young pink growing shoot

BULBS, CORMS AND TUBERS

This extraordinary group of plants ranges over a number of families and genera, and includes plants which provide many of our staple foods as well as boasting some of the most beautiful horticultural specimens known.

A striking feature of the group is its ability to survive harsh conditions. Modified leaves (bulbs), stems (corms), and roots (tubers) have developed as underground food stores which enable the plant to survive and when necessary, to reproduce without setting seed. Because of this enterprenerial trait, even single garden plants, dumped into bushland, may become the nucleus of a new weed infestation.

Many common bushland weeds exploit this trait and are quick to take over any damp, sunny spot. The orange montbretia *(Crocosmia x crocosmiiflora),* pink bugle flower *(Watsonia angusta),* New Zealand Christmas bells *(Alstroemeria psittacina)* and white Formosa lily *(Lilium formosum),* are common plants in drainage ditches and along roadsides. Onion weed *(Nothoscordum inodorum)* and garden *Oxalis* are discarded in lawn clippings and unwanted soil, while asparagus "ferns", madeira and arrowhead vines, and the variegated spider lily *(Chlorophytum comosum)* are often dumped with garden prunings. Throw-outs from ornamental ponds such as elephant's ears *(Alocasia macrorrhizos),* and Arum lilies *(Zantedeschia aethiopica),* may choke small dams and creeks.

Even old garden favorites such as freesia *(Freesia refracta)* and daffodil *(Narcissus spp.)* can invade bushland, although they rarely establish in quantities detrimental to the native flora.

ERADICATION Unless the soil is very moist when you try to pull the bulbs from the soil the leaves will break away, leaving the reproductive part in the ground. So for all plants with swollen underground root systems the simplest solution is to dig out the clump with a strong garden fork. But make sure that you take some of the surrounding soil to catch the tiny bulblets and offshoots which will break away from the parent plant. For really severe infestations, the surest solution is to remove the bulbs and all of the surrounding soil. Removing the leaves regularly from persistent bulbs such as onion weed will eventually deplete the food store, but this is a long-term exercise. Bulbs can also be successfully treated with glyphosate. Apply herbicide late in the summer, after flowering, and spray or wipe the leaves with a weed wand. Treating bulbs immediately after flowering will ensure that maximum herbicide moves down into the storage organ. A repeat treatment in the following season will almost surely be needed, especially for large infestations.

Taro or Elephant's Ears

Canna Lily

THE TURF GRASSES

KIKUYU GRASS (*Pennisetum clandestinum*)
COMMON COUCH *(Cynodon dactylon)*
BUFFALO GRASS *(Stenotaphrum secundatum)*

Used widely for soil erosion control, landscaping and agriculture, exotic turf grasses create serious problems for bushland. Unlike most native grasses which grow in tussock or open-clump formation, turf grasses form a dense sward on the surface while the root system grows into a mass of intertwined rhizomes - ideal for retaining loose soil and outgrowing competitors.

With enough sunlight and bare soil, turf grasses invade bushland at any vulnerable point: along tracks, fire trails and service corridors, from ovals and picnic areas. Kikuyu in particular, has long been planted into bushland clearings and disturbed sites to prevent soil erosion. Once established it invades along edges, even climbing short distances to scramble over shrubs and young trees.

Kikuyu Grass with its distinctive white stems

Seeds are distributed by birds, ants and small animals. Gardeners who dump the weekly load of grass clippings (seeds and all) into the bush may think that the material will fertilize the soil and do no harm. Not so! Dumping always spreads weeds. The seeds will germinate and the fleshy white portion at the base of the blade (the rhizome) will readily regenerate into a new grass plant.

ERADICATION. Digging out turf is a hard job but will succeed if you dig to a sufficient depth to remove all the root system. Be prepared to rework the area several times. To control individual plants with attached runners, work with a sharp knife and sever the fibrous roots growing from each leaf node. Roll the runner up over your hand until you reach the main growing point, then run the knife under the roots until the plant can be lifted from the ground.

Most grasses are susceptible to dilute solutions of glyphosate, even at rates as low as 1:150-1:200. Spraying with a low-volume garden sprayer in cool, still weather conditions will control most grasses, although several sprays may be required for complete control. The herbicide is taken into the plant body at the point where the leaf blade joins the stem so be sure to spray the grass from above.

BITOU BUSH or BONESEED

(Chrysanthemoides monilifera)

Originally imported into Australia to stabilize coastal sand dunes, this attractive yellow daisy bush has become incorporated into many a seaside garden. An erect, densely branched shrub, bitou bush grows up to 3 metres high. The alternate leaves are broad, with a serrated edge and a pointed tip, often carrying tufts of white down. Two subspecies are recognized, which are differentiated by the shape of the leaves and the berry-like black fruit. Both species are widespread in coastal Australia, but they also occur further inland, on the central tablelands and in western NSW.

ERADICATION. Bitou bush can be treated in the same way as other woody weeds. It is easy to dig out and responds readily to glyphosate, used as a spray or applied by the cut-stump method. Bitou layers readily so each separate stem must be treated, and all of the root system removed. Seeds may last many years in the soil, and are frequently stimulated to germinate by disturbance such as fire. The adult plants are killed by fire but the ensuing seedling growth is easily eradicated using a 1:100 solution of glyphosate.

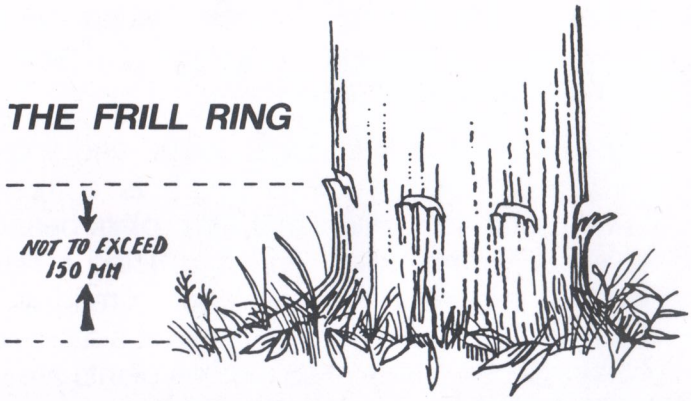
Bitou Bush in flower

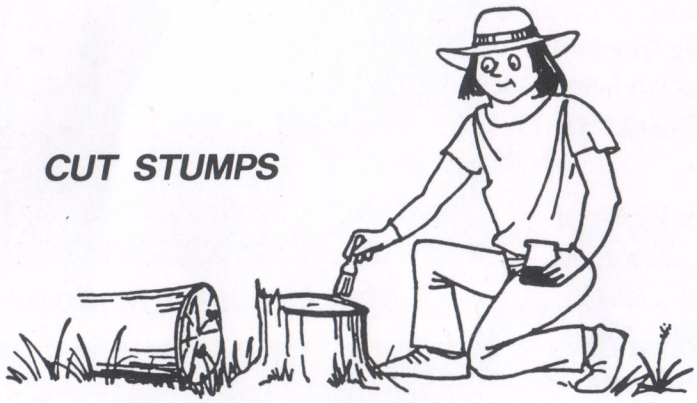
THE SAFE AND EFFECTIVE USE OF HERBICIDES

Glyphosate is a systemic herbicide which, once in the plant's sap system, travels throughout the plant body to achieve a total kill. It has almost no residual effect as it binds to soil particles on contact and eventually decomposes to harmless substances. Because it binds so tightly to the soil the herbicide does not move through the soil to poison other non-target plants. However, be aware that glyphosate will kill any plant if it comes into contact with the leaves or green stem. A readily available glyphosate herbicide is Roundup, known also as Zero in diluted form.

Glyphosate may be applied by **STEM INJECTION.** Use a brace and bit or cordless drill to make holes, about 5cm apart, into the stem (below the bark but NOT into the heartwood.). An eyedropper, hypodermic syringe or injection gun can be used to place 1-2ml of herbicide into each of the holes.

Alternately, a small chisel, knife or axe can be used to scrape away the outer bark and expose the moist sapwood in a method often termed **FRILLING.** A paintbrush or any non-drip applicator is used to apply herbicide to the raw wound. For multi-stemmed plants it is essential to treat each stem. NEVER ringbark the tree as this will prevent the movement of herbicide throughout the plant's sap system.





The **CUT-STUMP** technique is successful on most woody weeds with poisoning of the root system and removal of the tree itself in one operation. Cut the stem with loppers, brushsaw or chainsaw close to ground level and apply undiluted glyphosate with a dropper or paintbrush within 30 seconds. If a delay occurs, re-cut and apply the herbicide to a fresh surface.

Diluted glyphosate can be applied to leaf surfaces by **WEED WAND** or **SPRAYING.** Spraying is useful for control of unwanted grasses and other herbaceous weeds. If spraying, choose a warm day when the air is still. Use reliable equipment, avoid direct contact with the chemical, and wear protective clothing.

Like most herbicides, glyphosate works best on a healthy plant. Always treat with herbicide when the plant is actively growing - usually in warm sunny weather. Do not treat a sick plant or one under stress from heat, cold or drought as it will not absorb the herbicide. Generally, treat ANNUAL WEEDS early in the season when they are growing quickly, but treat PERENNIALS (including bulbs) after flowering and before fruit is set. For perennials this is the time when there is maximum movement of food material down to the root system - the ideal time for reaching the roots with poison.

ALWAYS FOLLOW THE INSTRUCTIONS ON THE LABEL. The instructions have been placed there to help and protect you. If the weed you are trying to eradicate is not listed on the label, or the suggested dosage rate does not appear, contact the Registrar of Pesticides at the Department of Agriculture for assistance.

WATER WEEDS

Aquatic plants play a vital role in the food chain, forming the backbone of wetland areas and providing food and shelter for a wide variety of animals. But alien aquatics have established in our waterways costing the taxpayer millions of dollars annually to control. Most were introduced as aquarium or horticultural plants, but have now spread into the irrigation and flood control systems, and in many areas hinder recreational use of the waterways.

Four aquatic weeds have been declared noxious Australia-wide: water hyacinth *(Echhornia crasspipes),* Salvinia *(Salvinia molesta),* alligator weed *(Alternanthera philoxeroides),* and Lagarosiphon *(Lagarosiphon major).* Also of major concern are the aquarium "throwouts: canadian pondweed *(Elodea canadensis),* oxygen weed *(Egeria densa),* arrowhead *(Sagittaria sagittifolia),* and watermilfoil *(Myriophyllum spicatum).*

Commonly found in garden ponds, and voted the world's worst waterweed, water hyacinth is a free-floating plant joined by runners or stolons, each plant bearing a clump of leaves on a short stem and producing a lilac-blue flower. Seed germinates in shallow water or mud and may remain viable for 20 years or more. Hyacinths also reproduce from broken pieces of stolon so that the plants are readily spread in floodwaters.

In contrast, *Salvinia* is a free-floating fern with trailing "roots". The fronds or "leaves" are undivided, paired, and range from oval and flat in small isolated plants, to heart-shaped or oblong and deeply keeled when crowded.

The plants drift on the surface, forming dense mats which cut off light and oxygen to the pond dwellers below, eventully changing the pond's ecosystem. Salvinia is sterile, reproducing from broken pieces of the short stem. Infestations may double in size every 3-5 days.

Elodea is a submerged plant which roots in gravel and silt. Flowers are produced in summer, floating to the surface to be pollinated. The brittle stems grow up to 3 metres long, bearing whorls of thin green leaves. The stems fragment in late summer to produce numerous small plants, A long-time favorite of the aquarium trade, Elodea is a great survivor, living in both tropical and cool waters.

ERADICATION. Control of aquatic weeds currently centers on a combination of chemical, biological and physical techniques. However, for small infestations more simple methods may suffice. As a first step, correct identification is essential: then selection of the appropriate technique - dredging, raking, netting, draining the pond, or the careful use of selective herbicides. The use of any herbicide near water is dangerous, so before attempting to use herbicide always contact the council's Noxious Weeds Officer, the NSW Department of Agriculture and Fisheries, or the Australian Water Resources Council for advice.

Salvinia floats on top of the water

Water Hyacinth in flower

Submerged Elodea

CACTI AND OTHER SUCCULENTS

In spite of their diversity, all succulents have one thing in common: the ability to store water in their leaves, stems or roots. Some, like cacti, are native to the Americas, but succulents are cosmopolitan in their distribution. Their ability to withstand extreme conditions and to regenerate from even tiny portions of the parent plant enables them to survive and spread when they are dumped in the bush.

Ornamental succulents come in a wide variety of sizes, from the giant century plants *(Agave americana),* the Yucca and Aloe with their thick fleshy leaves, and mother-in-law's tongue *(Sansevieria grandis),* to the small "hen and chicken" sedums and mother of millions *(Bryophyllum tubiflora).* Representing the daisy family is black-eyed susan *(Coreopsis lanceolata),* a fleshy stemmed plant which has been widely spread along the highways of NSW and Victoria by well-meaning admirers.

"Prickly pear" *(Opuntia spp.)* is the common term for many cactus species. There are over 800 of these, but only 9 are considered weedy, with tiger pear of most concern in NSW. First imported from the Americas over 200 years ago to nourish the cochineal beetles which produced red dye for military uniforms, prickly pear is still scattered over more than one million hectares in NSW where its sharp spines cause serious damage to stock and humans.

Most cacti are formed of numerous smooth segments covered with sharp barbs which attach easily to passing animals or vehicles. They shatter easily and the pieces can be distributed widely by floodwaters or even wind, but most cacti invade local bushland after pieces are dumped with garden rubbish. As their tissue contains a great deal of water, fragments may remain dormant in dry soils for many months, only to regenerate with the next rains.

ERADICATION. Most succulents respond poorly to herbicide. The "juices" tend to dilute the poison and reduce its effectiveness. Small plants can be controlled with glyphosate used as a spray, although repeat treatments may be necessary. For large specimens or isolated plants digging may be the best option. Burning the plant out with a very hot fire is effective and will dispose of the unwieldy carcass at the same time. When removing cacti be particularly wary. Injury caused by the sharp spines may require surgery and the sap produced by some species (e.g. *Aloe & Agave*) may burn and ulcerate the skin. Remember succulents grow from fragments so always dispose of the debris carefully!

Mother of Millions is only small but it spreads very easily

Sedum

Century Plant

PAMPAS GRASS

(Cortaderia selloana)

Pampas Grass

Pampas grass is widespread in the Sydney area, especially on cleared or disturbed sites. The leaves of the large tussock are flammable when dry and dense groups may increase the bushfire hazard. It competes strongly with native plants for space and available soil nutrients while the sharp cutting leaves impede walkers on bushland tracks.

Now declared as a noxious plant in N.S.W. pampas grass was once a prized garden plant. It is a long-lived perennial which forms a large tussock, growing to 1m or more in diameter at the base and over 2m high. The leaves are long and narrow, yellow-green to grey-green with sharp cutting edges. The spectacular fluffy flowerheads, up to 3m high, are produced in late summer. Two sex forms develop on separate plants: the white, fluffy females and the yellow/pink/mauve and almost hairless bisexuals (or hermaphrodites). Both forms set up to 100,000 seeds per plume on up to 40-50 plumes per mature tussock. You can see why pampas poses problems for urban bushland.

The tiny seeds can travel 40 kilometres or more on wind currents as well as floating down bush creeks and drainage lines. Pampas grass is often spread into bushland from fragments included in garden refuse dumped along roadsides. All parts of the tough root system resting on damp soil can regenerate to form new plants.

ERADICATION Small plants can be hand-pulled and large tussocks can be grubbed out. Slash back the sharp leaves, then sever the shallow roots around the base of the tussock and lever out the root mass. Use a sharp hatchet and a crowbar but be sure to get all the hard rhizomatous root base out. Burn the tussock or bury it at the local tip.

Pampas clumps can be burnt using diesel or sump oil but this is messy and sometimes unsuccessful. Glyphosate works well on pampas. Spray in the season of maximum growth, usually the summer, on a still cool day. Get maximum cover of the leaf surfaces and as much herbicide as possible into the centre of the clump. For large tussocks several applications may be necessary over some months but for small plants a single application should suffice. Spot-spraying with a small hand-held pressure sprayer is an efficient way of eradicating large numbers of young plants.

FISHBONE FERN

(Nephrolepis cordifolia)

Fishbone Fern

One of the few ferns to be listed as a weed, Fishbone Fern is commonly found in old gardens, along creekbanks, and in sheltered bushland areas.

As a fern it produces no flowers. Its spores spread on the wind or it regenerates from its thin wiry rhizomes. The fronds grow to 1 metre with large clumps forming from a central core within a short time.

ERADICATION. Herbicide can be used for control, but it is usually easier to dig out these shallow rooted plants. Although the "water bubbles" joined to the rhizomes are harmless, they are so closely attached to the growing tissue that total removal of the plant's root system is recommended. Dispose of the material carefully and weed out regrowth systematically.

LANTANA

(Lantana camara)

Lantana is a common weed of pastures, forests, roadsides, creeklines and disturbed land in high light situations. Although there are many benign horticultural forms used in gardens, the common red and pink forms are declared noxious weeds in many parts of NSW. The red form is known to be toxic to cattle and sheep, while the pink form is a major weed of bushland on the Central Coast.

The green fruits of both forms can be poisonous and the sharp prickles and hairy leaves produce allergic reactions in many people. Lantana has been shown to bring about substantial changes in soil chemistry and structure, interfering with nutrient recycling and inhibiting native plant regeneration. It has a remarkable growth rate, especially in wet weather, spreading to displace all native undergrowth. Growth of lantana up into the tree canopy encourages the growth of fungi and other pathogens and is a major contributing factor to the eventual death of the trees.

Lantana in flower

Lantana is a scrambling shrub up to 4m high with square prickly stems. Plants frequently root where side stems touch the ground so that extensive interconnected thickets are formed. The rough leaves are mid-green with slightly round-toothed edges and they have a distinctive "sharp" smell which can be used to distinguish them from the native look-alike, poison peach *(Trema aspera).* Lantana flowers throughout the year with the pink, red or yellow flowers in dense heads at the end of long stalks.

ERADICATION As the plant is shallow-rooted it is relatively easy to pull out, but all the large surface roots must be removed or they may re-shoot. Branches and stems must not be left lying on the ground where they can take root. Alternatively each stem can be cut with a bushsaw or garden loppers and painted with undiluted glyphosate.

Large clumps of lantana may be sprayed with a number of herbicides marketed for that purpose. However, glyphosate works well at a rate of 1:100 when sprayed in summer and maximum leaf coverage is obtained. The dead clumps may be left on the spot to rot or bashed down and compacted prior to burning. Lantana is difficult to burn as the wirey stems retain moisture for a long period of time. Resprouting will invariably occur if lantana is burnt without first treating with herbicide.

WHAT IS A NOXIOUS WEED?

These are plants declared "noxious" under the Noxious Weeds Act (1993) because they cause serious economic loss to agriculture, or have a detrimental effect on man, animals, or the environment. A noxious declaration in NSW binds the landowner (whether private or government) to control the weed and/or prevent its spread onto adjacent property. Local councils are responsible for enforcing the Act and failure to comply may result in a heavy fine. Where a council fails to control noxious weeds on its own land, NSW Agriculture may do so and recover costs.

In NSW noxious plants are declared in one of four categories. Categories 1-3 are mainly agricultural weeds or those harmful to human health. Category W4 includes the "environmental weeds" which invade bushland. Many plants in this booklet are declared W4 noxious weeds in the Sydney area. A Council may nominate to have a problem plant declared W4 in its area but this does not bind adjacent councils to do likewise. For further information, contact your local Council or NSW Agriculture.

CASSIA or ARSENIC BUSH

(Senna pendula)

The bright yellow pea flowers are a common sight in local bushland. There are nine species of cassia in the Sydney region but some of them are native so correct identification is essential. The cassias all have pinnate leaves (leaves made up of a number of leaflets) but the number of leaflets varies between species.

The weed cassia from tropical America, grows as a multi-stemmed shrub up to 3.5m tall. The stems and leaves are hairless with three opposite pairs of leaflets in each leaf. The small leaflets are almost elliptical with a gland between the lowest pair. The flowers have five petals and the hard black seeds are held in long bean-like pods which ripen in winter.

The weedy cassia is often confused with the native shrub *Breynia oblongifolia* as the leaves of both species are much the same size and shape. However, cassia leaflets are arranged in opposite pairs while those of Breynia are always alternate.

ERADICATION As the cassia occurs only as a scattered weed in bushland it is easy to control. The plant may be cut-stumped and poisoned but it is easily dug out. Remove all the roots and dispose of the pods.

Cassia - flower and pods

AFRICAN OLIVE

(Olea europa var. africana)

Grown as a garden ornamental and as a hedgerow species, African olive has spread from its original Australian planting at Camden Park to become a major weed of urban bushland. It is usually found on clay soils but is capable of growing in most situations, sun or shade, moist or dry. Its numerous berries are spread by birds.

An evergreen small tree the African olive has distinctive drooping branchlets. The dark-green lance-shaped leaves are 5-10cm long with a recurved tip. Tiny brown scales are characteristic on the underside of the younger leaves. The flowers form in late spring as tiny white tubes at the junction of the stem and leaves, and the succulent green berries ripen intermittently to black through late autumn and winter.

ERADICATION Total removal of the large surface roots is recommended. Olives, like privet, tend to resprout abundantly if lopped or cut down. Treatment of the cut stem with undiluted herbicide or poisoning by tree injection is necessary for total control (see centre page).

African Olive in flower

THE BERRY BUSHES

COTONEASTER *(Cotoneaster glycophylla)*

FIRETHORN *(Pyracantha spp)*

These hardy garden plants are grown for their brightly coloured winter berries, often as hedge plants or in rockeries. Unfortunately the birds have developed a liking for the succulent fruit and have spread these plants through the bush.

Both species are members of the rose family and although they grow best in cool climates they berry prolifically in the warm coastal districts. The most common species in the Sydney area is a tall shrub, growing to 3m or more with long arching stems. The small elliptical leaves vary from dull grey-green to bright-green according to their position in full sun or shade.

The berries range from yellow through orange to brilliant red. Several varieties of cotoneaster are deciduous and the evergreen firethorn, as its name implies, bears long sharp thorns. The tiny white flowers bloom in spring.

ERADICATION Both species are troublesome plants on the Central Tablelands and in the ACT. At present in Sydney they occur as scattered plants in the bush, but the huge seed source in suburban gardens will ensure a steady invasion of the berry bushes into native bushland. For this reason consideration should be given to removing garden plants. They are relatively easy to eradicate - simply follow the directions given for other woody weeds.

Cotoneaster in fruit

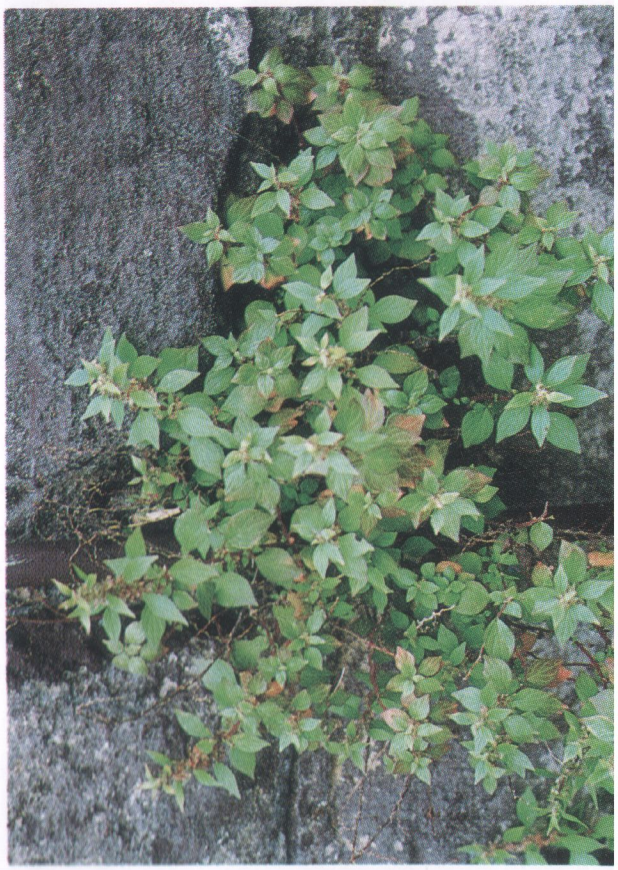
STICKY WEED or PELLITORY

(Parietaria judaica)

Pellitory is a weed of roadsides, enbankments and stone walls and is often found in old neglected gardens around the North Shore. The copious wind-borne pollen has been implicated in a number of serious respiratory diseases. As a result, the plant has been declared noxious in a number of Sydney council areas.

Pellitory is a soft sprawling perennial herb which closely resembles its larger relative, the stinging nettle. It grows to 60cm high with leaves 1-4cm long. Both stem and leaves are covered with tiny hairs which cling to your clothes. The green flowers form in clusters in the axis of the stem and leaf.

ERADICATION Eradication is fairly simple as the roots easily pull out of the soil but weeders should not attempt this when the plant is flowering and possibly should also wear gloves to avoid any allergic reaction.



Sticky Weed

RHUS or WAX TREE

(Rhus succedanea)

A native of China and Japan the rhus is widely grown for its spectacular autumn foliage. Unfortunately many people suffer severe allergic reactions when they come into contact with the sap or the leaves. Rhus is a declared noxious plant in N.S.W. and must be removed from gardens. Rhus is a minor weed problem in Sydney bushland which is expected to worsen if more people plant the tree in home gardens.

Rhus grows as a large deciduous shrub or small tree up to 8m tall. Its dark green leaves are formed of 7-15 leaflets. The yellow flowers are very small, appearing in spring just after the new leaves. The large clusters of fruit ripen to a tawny colour between May and September and are eaten by a wide variety of birds.

Often confused with the harmless pistachio tree *(Pistacia chinensis)* Rhus can be distinguished by a careful examination of the leaf structure.

ERADICATION This plant should be handled with extreme caution. Contact with the sap is dangerous and protective clothing should be worn. To dig it out wait until the leaves have fallen, then dig up as much of the root system as possible. Do not attempt to burn the plant as inhalation of the smoke is said to be dangerous.

The plant may be treated with undiluted herbicide using the cut-stump method, stem-injection or axe-cut (see centre page).

Rhus

WILD GINGER or GINGER LILY

(Hedychium gardneranum)

The ginger lily is a spectacular garden plant with long strap-like leaves and large spikes of perfumed yellow and orange flowers up to 25cm long. Unlike its close cousin, the cultivated ginger, this species is not edible.

The underground parts of the plant form a large fleshy rhizome (underground stem) which may run along near the soil surface for a metre or more. Growing buds are located at intervals along the rhizome so that many leaf and flower stems arise from a single stem. Like most rhizomatous plants, the spread of ginger lily into the bushland is the result of dumping unwanted garden plants.

ERADICATION To remove ginger lily, expose the thickened rhizome just under the soil surface and cut along both sides with a sharpened knife. Lift the whole plant from the soil and dispose of it carefully as even a small section will resprout to form a new plant.

Ginger Lily in flower

BAMBOO

CANE or CLUMPING BAMBOO

(Arundinaria pachymorph)

GOLDEN BAMBOO

(Phyllostachys leptomorph var. aurea)

The bamboo family is a large group of over 200 woody tussock-forming perennials. In Australia the bamboos are grown as ornamentals but elsewhere they are used for building, paper, weapons, musical instruments and food.

Bamboos are closely related to the grass family. The long strap-like leaves are yellow-green with parallel veins but there are also variegated and dwarf forms. Bamboo rarely flowers under Australian conditions. It steadily increases in size by vegetative growth from the root mass.

There are two common forms of bamboo: a clumping variety *(Arundinaria)* and a rhizomatous variety *(Phyllostachys),* usually lumped together as 'bambusa'. Although Clumping (Cane) bamboo can spread slowly from the centre, it is the rhizatomous Golden Bamboo which spreads rapidly and causes most problems, often lifting patios and cement paths and invading sewer pipes. It causes similar havoc in the bush.

ERADICATION As most of the stems are interconnected with roots forming a dense, almost impenetrable network underground, bamboos are difficult to eradicate. It may be cut-stumped and poisoned but every stem must be treated. You can dig it out but be sure to extract every last root piece. Better still - never plant a bamboo in your garden!

Golden Bamboo

CROFTON WEED

(Ageratina adenophora)

A native of Mexico, crofton weed is an aggressive non-woody plant which disperses its fluffy seeds on the wind currents. It grows well in sun or shade and is usually found in damp places, in creeklines, on roadsides or bushland tracks where the natural drainage patterns have been altered in some way, and at the outflow point of most stormwater drains. Crofton weed is highly toxic to horses and can readily kill if enough plant material is consumed.

Crofton grows as a bushy plant, 1-3m high as a cluster of long upright stems which are covered with short reddish hairs. The large, floppy triangular leaves have serrated edges with very long petioles. The white flowers cluster in dense terminal heads which form a spectacular display in early spring.

ERADICATION Crofton weed is relatively easy to remove. The whole plant can be pulled out of the soil provided the ground is moist. However, if the areas is boggy it will quickly become re-infested by wind-borne seed. The answer to crofton control usually lies in correcting the drainage problem which allowed the weed to first become established.

Crofton Weed in flower

THE ASPARAGUS FERNS

ASPARAGUS FERN
(Protasparagus aethiopicus)
BRIDAL CREEPER
(Myrsiphyllum asparagoides)
CLIMBING ASPARAGUS
(Protoasparagus plumosus)

Although often referred to as ferns the asparagus are actually members of the lily family. Originally imported from South America, at least three species of asparagus fern are widely grown as garden and houseplants. The attractive red berries are widely dispersed by birds but infestations in bushland often occur from dumping of garden refuse, especially around older suburbs.

The **FERN ASPARAGUS** is a dense scrambler with pink flowers, red berries and spiny dark-green scales replacing the leaves. The green arching stems have sharp prickles and may grow up to 2m long. The berries ripen in late winter and spring.

BRIDAL CREEPER (or **BABY SMILAX**) is a woody scrambler, with small lance-shaped leaves often found growing along creeks. Its sprays of sweet smelling white flowers are prized by florists. Each petal has a distinctive green stripe up the centre and the fruit is a small black berry. The root system is a complex of starch-storing tubules attached to a horny flat crown.

The **CLIMBING ASPARAGUS** is also greatly favoured by florists as well as home gardners. It has wispy dark green leaves and sharp thorns. It is capable of climbing tall trees and scrambling through the canopy.

ERADICATION

Asparagus fern can be removed manually. First cut away the prickly stems, making sure to bag all the berries as even the green ones will ripen on the ground. Then remove all the horny crown at the base of the stems by cutting around the root mass with a sharp knife. The water "bubbles" attached to the roots need not be removed. However, when removing the bridal creeper, be sure to remove ALL the root system, including the sharp horny crown.

Asparagus Fern with its red berries

Climbing Asparagus

The plants described in this booklet are only a selection of the many weeds infesting bushland. They include some of our worst problems and are representative of those plants most likely to occur in our gardens. For further information about the urban weed problem contact Urban Bushland Management Ltd, the National Trust of Australia (NSW), the NSW Department of Agriculture, or the Parks and Gardens section of your local council.

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